

## Skimming/Processing and Expected Output

### Abstract

Determine what to expect from the Pass2 processing that is to be started the week of November 21.

## 1 Scripts

New processing will have the kcm flag DCFIT1 OFF. This will make the UTC track fit independent of TG pion hits.

- Stage data to disk.
- Submit executable to skim out data in skims 5,6,7 (i.e. 1/3 signal streams).
- Change staged data name (a way to flag exec. is done).
- Submit executable to skim out data in skims 4/8 (i.e. 3/3 kink stream).
- Remove staged data.
- Final output: Skim streams 4-8 and one ntuple sets for signal streams and one ntuple set for kink stream.

## 2 Pass2 Code

### 2.1 New kcm Flags

- *TGRECON1* - a new kcm flag placed in pass2\_ana\_setup.kcm and pass2\_ana\_pion\_setup.kcm, and if needed pass2\_ana\_muon\_setup.kcm. This flag will force the *TGConstructor/TGRecon* routine to run on every event (called at the end of *swathccd*).
- *GOODKINK* - a new pass1 cut. If placed in the p2\_pass1\_cut\_setup.kcm (used for data) and/or p2\_pass1\_cut\_setup\_pass\_all.kcm (used for monitors), then the event will fail pass1 if it is not a kink and will not be written in the ntuple. When this pass1 cut is applied an reduction of  $\sim 28\times$  is expected in ntuple size.
- NOTE: *SKIM 4/8* will have the kcm flags **ON** for *TGRECON1* and it *GOODKINK*, but they will be **OFF** for *SKIM 5-7*.

## 2.2 Error Fixes

I fixed a few errors that were showing up in the log files of my test runs.

- Fixed a few HFNT errors from the log file.
  - Fixed in ntlimits.F: dtpi, tpiop\_tg(),epvtg(),tpi\_tg(),ebastbl().
  - offadpuls - changed range from [0,255] to [0,256].

## 2.3 Added Routines and .cmn files

- *Joe Milenberger* ... all that I have done is to record the existing fail codes that have always been reported by the unpacking routines via calls to the fail\_status entry point of standard KOFIA library routine fail.F . These are exactly the messages that get summarized at the end of the log file with messages such as  
IFAIL = 0 (BM ADC : GOOD DATA ) 5073 5073  
IFAIL = 6 (BM TDC : Too many hits on a channel ) 37 37  
IFAIL = 0 (BV ADC : GOOD DATA ) 4988 4988  
IFAIL =11 (BV ADC : cannot locate data bank ) 122 122  
except now we record every such non-0 instance for every event. I believe the reason we are now seeing non-0 codes for almost every event that the standard reporting routine does not "latch" on non-0 error codes, i.e. it simply keeps overwriting the saved return code for that subsystem with the result from the last call for that subsystem. Saving the results from all calls in the ntuple is now effectively doing what the built-in error reporting should have been doing (in my opinion), but wasn't.
  - *pass2\_fail.cmn* - New
  - *fail.F* - New
  - *show\_fail.F* - New
  - *pass2\_define.F* - added HBNAME call (see New Variable section).
- *Jim Frank*
  - *p2\_target.cmn* - commented out nedge\_tg, etc (3 lines). This saves ntuple space.
  - *store\_tgic.F* - added lines
  - *tgrphi.F* -
  - *set\_targetccd4.F* -
  - *get\_tim\_e949new.F* - added a line.
- *Ilektra*
  - *pass1.cmn* - added ntuple common parameter - for new ntuple block.
  - *fcn\_trkrng.F* - saved values to new ntuple variables.
  - *trkfit.cmn* - added variables (Tf\_RESID\_ANG\_FIN to trkfit common, reordered common block - to save only desired quantities.
  - *pass1\_define.F* - added HBNAME call

- *tr2unp.F* - Fixed bug to HEX afterburner variable unpacking.
- *Benji*
  - *Removed Common Blocks* L11, tdprompt, KToshio (modified toshio fitter info on kinked events), TGFIT (additional info on quantities used in toshio fitter).  
NOTE: UTCTT (using TG quan. in UTC fit; cos3d1, etc) is not in 'new' ntuple. Line precludes it when DCFIT1 is off.
  - *ntlimits.F* - see Error Fixes.
  - *setup\_pass1.F* - Created new pass1 cut bit (see New kcm flags); lines added for saving of new variables. Fixed rtg=0 bug when itgqual=1.
  - *swathccd.F/swath\_bad\_check.F* - Modified such that *TGRecon* will be called only when either *swathccd* fails or TGRECON1 is set to ON in the kcm file.
  - *tgpfcn.F, tgpif.F* (Toshio Fitter routines) modified to save quantities to ntuple.

## 2.4 Added Ntuple Variables

- *Joe Mildenberger* diagnostic error output (esp. for TG tdc's)  
nbad, iss\_bad, ifc\_bad(nbad)
- *Ilektra* - PRRF cut additions  
tf\_chisq, tf\_z1chisq, tf\_z2chisq, tf\_z2bchisq, tf\_fitpar, tf\_resid\_csy, tf\_resid\_sx, tf\_resid\_el, tf\_resid\_ang\_fin, tf\_qrssc, tf\_qseccx
- *Benji's* Additions for Toshio Fitter Output
  - chi5max - (Bipul's chi5max) cut on this value in previous pnn2. Is not the correct chi5max!
  - chi5max2 - corrected chi5max.
  - verrng - cut on this value in previous pnn2.
  - angi- cut on this value in previous pnn2.
  - nchihits - number of elements used in Toshio's Target Fitter.
  - tchimod(nchihits) - element # of target fiber.
  - tchi5fib(nchihits) -  $\chi_5^2$  parameter of Toshio's Fitter for each element.
  - tchi6fib(nchihits) -  $\chi_6^2$  parameter of Toshio's Fitter for each element.
  - tchi7fib(nchihits) -  $\chi_7^2$  parameter of Toshio's Fitter for each element.

## 3 Outstanding Problems in Pass2 Source

- No current problems, except what is noted in the following section.

## 4 What are the kinks like in the new SKIM4/8?

Question: What catagories are the kinks located in and will they be duplicated in skims 1-3/5-7?

By looking at skims 1-8 on pnn1or2 monitors., I compared the newest processing code to the code that was originally used, May/June Processing, to skim out the events.

itgbad	1 (swath fail)	2 (K/pi gap)	3 (K timing)	4 (DV/B4 const)	9 (other)	ALL
Kink	29	26 (18)	6 (2)	3 (3)	17 ( 4)	81 (27)
Kinks near edge	8	5 ( 3)	1 (0)	0	3 ( 0)	17 ( 3)
IC Kinks	12	8 ( 5)	3 (1)	0	1 ( 1)	24 ( 7)
NOT Kinks	6	7 ( 6)	1 (0)	0	27 (21)	41 (27)
Total	55 (1)	46 (32)	11 (3)	3 (3)	48 (26)	163 (65)

Table 1: Events that have pass DELCO3 and pscut02\_kink.

Where do the kinks come from? Numbers in () are events that are in SKIMS 1-3/5-7

- What happened Here: itgbad=1 and duplicated!

RUN= 48446 EVENT=12475:

Due to the pass1 cut TGCUT changing definition to exclude  $itgqualt > 1$ , during original skimming no explicit cut on itgqualt was made. During original processing this event satisfied both skim(1) and skim(4), now only satisfies skim(4).

- RUN=48707 EVENT=48328; This event was in itgbad=2 (visually a kink) reported on 15nov05; now it fails DELCO3 because of worse determination of K fibers.

Due to change in *get\_tim\_e949new.F*. K-hit (element 179) changes time from 26.3343ns (before change) to 53.825ns (after change). Unknown the reason of why this is happening. See following pictures of event before and after.

2005/11/22 12.45

run 48707 event 48328 itg 5  
 KINK  $82.8684^\circ$  rzk 6.64712cm rznk 6.64712cm slope 0.28083 sm 0.03663  $r^2$  0.948192  
 ptot 206.227 MeV/c rtot 30.1831 cm etot 98.9011 MeV  $82.8684^\circ$  trs 36.8915

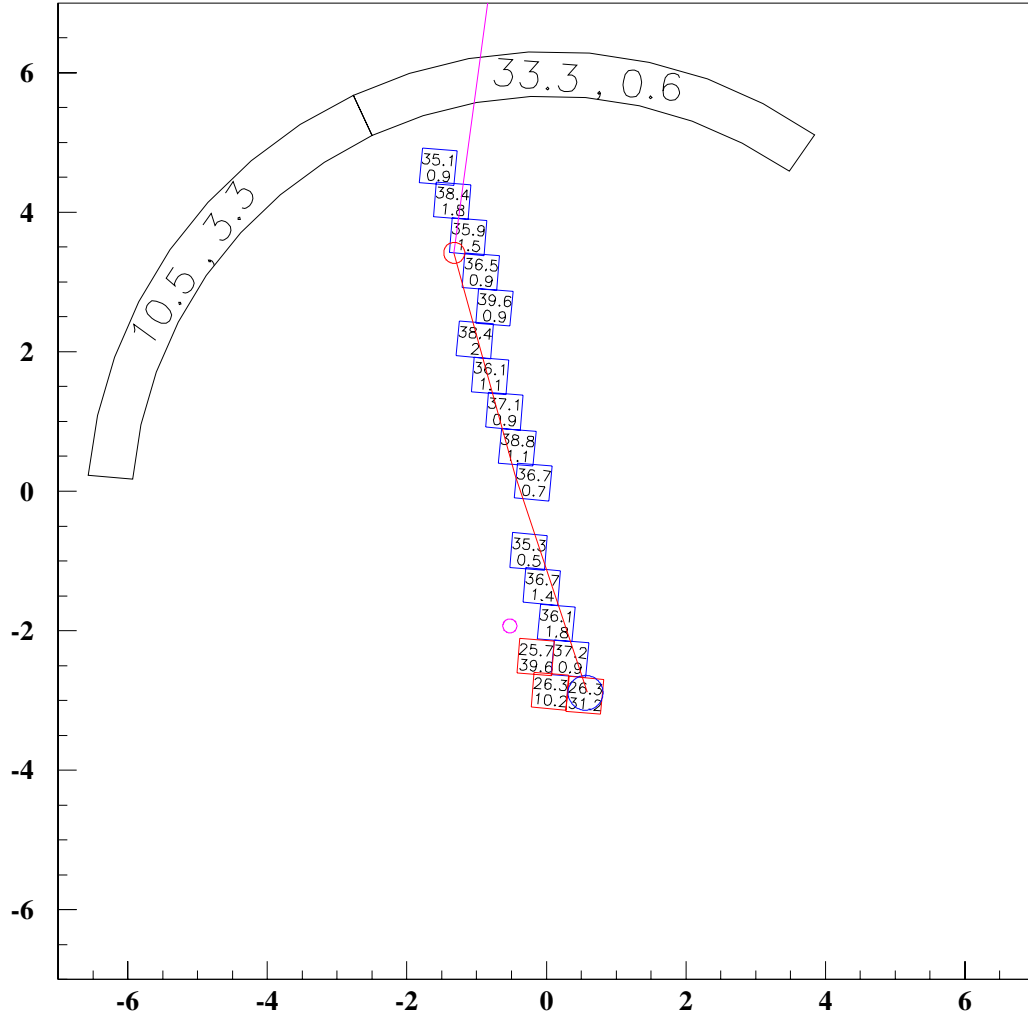


Figure 1: Run 48707 Event 484328; with old *get\_tim\_e949new.F*.

2005/11/22 12.46

run 48707 event 48328 itg 5  
KINK 82.8684° rzk 6.47605cm rznk 6.47605cm slope 0.28083 sm 0.03663 r<sup>2</sup> 0.948192  
ptot 205.714 MeV/c rtot 30.0122 cm etot 97.2161 MeV 82.8684° trs 36.8915

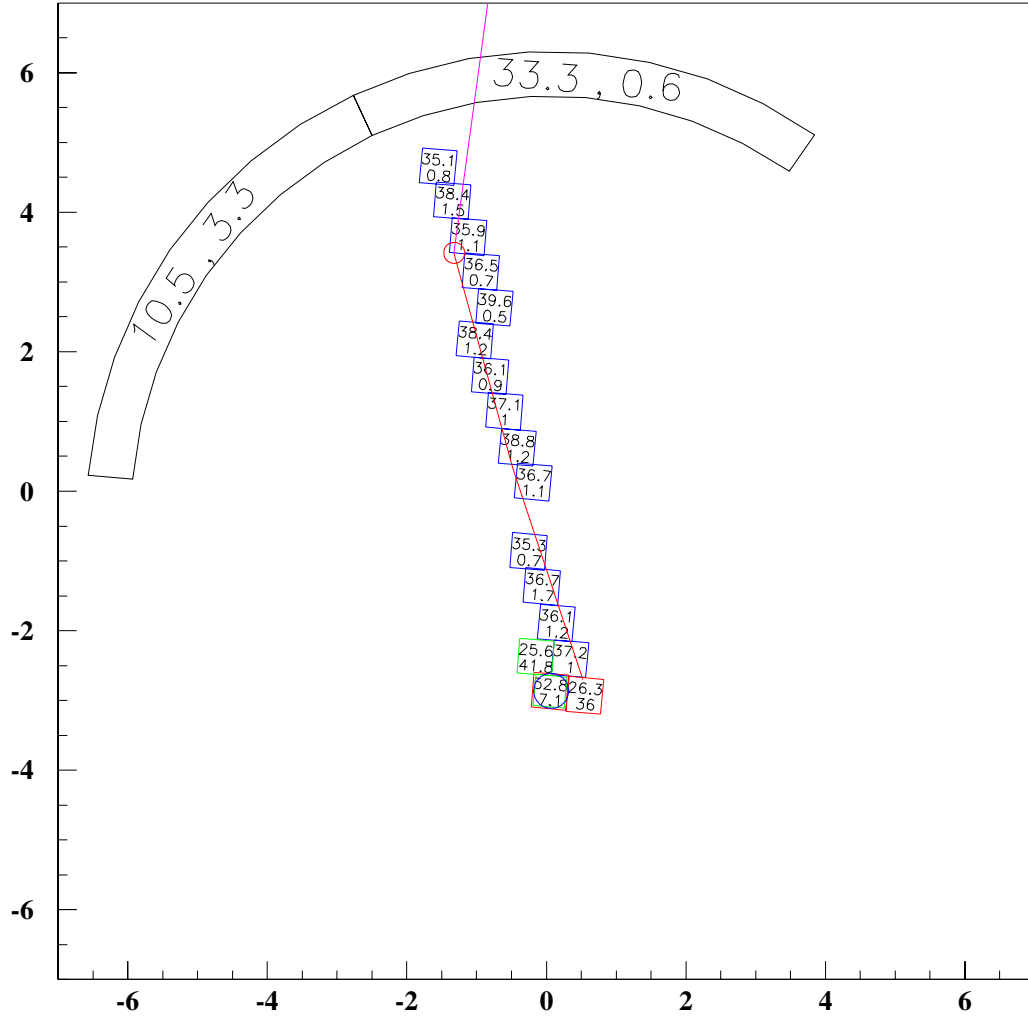


Figure 2: Run 48707 Event 484328; with new *get.tim-e949new.F*.